

The Burton Blatt Institute (BBI) is a research, education, and advocacy organization dedicated to advancing the civic, economic and social participation of people with disabilities worldwide. Our focus areas are employment, entrepreneurship, economic empowerment, civil rights and community participation. BBI has done extensive research, program development and education in the areas of assistive and accessible technology law and policy.

Access to wireless communication is extremely limited for the blind, but we believe the disability community, FCC, manufacturers, and service providers can work together to ensure that the blind and deaf-blind have access to fully accessible, affordable wireless phones.

1. What wireless phone features and functions in the current marketplace are not accessible for people who are blind, have vision loss, or are deaf-blind?

With few exceptions, virtually all features and functions of commercially available mobile phones are inaccessible to blind people at the time of purchase. Even those that offer some accessibility only allow blind people to dial phone numbers and answer calls. Functions such as reading the caller ID, entering and retrieving phone book entries, sending and reading received text messages and e-mails, personalizing the phone's settings or sound profiles, and utilizing advanced features such as Web browsing are unavailable to blind or deaf-blind users unless they purchase third-party screen-access software, thus adding unnecessarily (in the range of \$295-\$395) to the cost of mobile phone access. Use of such third-party software is not only expensive, itself, but is only compatible with the more expensive smart phones and commonly doesn't make all the features and functions of the phone accessible.

The wireless marketplace also fails to provide accessible services to blind users. Because printed user manuals and promotional materials are inaccessible, people who are blind often rely on online information. Yet some carriers' websites are inaccessible, making it difficult to learn the carrier's capabilities (including accessibility features) and manage wireless services. Furthermore, accessible documentation is traditionally unclear or vague on accessibility features for phones. Service carriers should ensure that their Web sites are fully accessible, and that all documentation is both accessible and detailed, so that blind and deaf-blind users can fully understand their access options.

However, full accessibility is possible. The Apple iPhone is accessible through VoiceOver, a text-to-speech application that is built into the phone, to make all features and functions fully accessible to blind users without the purchase of third-party software.

2. What is the extent to which gaps in accessibility are preventing wireless communication access by the blind?

Inaccessibility of wireless communication access has major consequences. With a 70% unemployment or underemployment rate, most individuals who are blind cannot afford the high-end phones that are compatible with accessibility software and cannot afford the additional expense of third-party software. The lack of affordable, accessible mobile communication technology prevents blind users from accessing text messaging and even from conducting simple tasks like retrieving a phone number without purchasing expensive hardware and software. Thus, blind users are essentially barred from purchasing basic mobile telephone technologies, and are excluded from using the wireless services others now take for granted.

Furthermore, the limited and expensive solutions to access are not promoted by carriers and phone manufacturers, leaving blind consumers unaware of the few options they may have. This can be attributed to the fact that even some carriers are unaware of what features on their phones are accessible for a blind user, and most carriers are unaware of the third-party access software or the flaws with low-cost handsets.

3. What is the cost and feasibility of technical solutions to achieve wireless accessibility for the blind?

Manufacturers can create accessible phones and achieve wireless accessibility for the blind in a number of ways. Existing phone software can be designed with text-to-speech technology so that prompts are spoken; and manufacturers can utilize Bluetooth technology, which is already incorporated into most phones, to output prompts to refreshable Braille displays for deaf-blind users. Regardless of which method a manufacturer chooses to pursue, it is most cost-effective and feasible if accessibility solutions are utilized during the design phase instead of after the fact. Third-party access software is both costly and complicated, while Apple has demonstrated with the iPhone that built-in accessibility is the most ideal solution for both consumers and manufacturers. As with physical accessibility of buildings, incorporating accessibility from the beginning likely adds little or no cost. Apple has proven that built-in accessibility is both technically feasible and cost effective.

4. Please explain the reasons why there are not a greater number of wireless phones (particularly among less expensive or moderately-priced handset models) that are accessible to people who are blind or have vision loss.

The greatest barriers to incorporation of accessibility in wireless phones appear similar to the barriers to incorporation of accessibility in other arenas: lack of awareness, failure to see the disability population as a legitimate market, and lack of clear legal obligation. Many phone manufacturers are unwilling to address the needs of blind consumers, and because there are no established accessibility guidelines for any consumer products, most wireless phone manufacturers are unaware of the inexpensive modifications they can make to achieve full accessibility. Furthermore, carriers are

not requiring accessible models to be made for them to sell. In order to solve this problem, effort has to be made by the government, wireless service carriers, and manufacturers to work together toward establishing the common goal of full accessibility.

5. Please explain the technical obstacles, if any, to making wireless technologies compatible with Braille displays, as well as the cost and feasibility of technical solutions to achieve other forms of compatibility with wireless products and services for people who are deaf-blind.

Wireless technologies can be made compatible with Braille displays. Currently, Braille display technology requires software to “drive” the remote display. Screen access software is required to generate the letters and Braille symbols on the display. Because there is not a one-to-one correlation between print letters and Braille symbols in contracted Braille (there are Braille characters that represent partial or whole words), software to do this translation is required. The software purchased to provide access to Windows Mobile and Symbian devices provides the translation algorithms necessary to display the correct Braille output. Braille translation software is readily available in the marketplace to blind people without charge. This illustrates the feasibility and cost-effectiveness of these innovations. Many Braille displays also provide the option to enter text or control the device through a built-in Braille keyboard. In order for this to function correctly, software on the mobile device must be capable of receiving this input and translating the entered Braille character into its print equivalent. As with speech output, Apple has built the ability to interface with a Braille display into its iPhone line of devices. Once other manufacturers accomplish the above steps, Braille displays can then be used with any phone that incorporates Bluetooth technology.

6. Please make recommendations on the most effective and efficient technical policy solutions for addressing the needs of consumers with vision disabilities, including those who are deaf-blind, and recommendations on actions that the Bureaus or the Commission should take to address the current lack of access. For example, is additional guidance needed on specific access features that should be included in wireless products? Should the Bureaus or the Commission facilitate a dialogue among stakeholders in order to reach a specific agreement to address the accessibility concerns outlined herein?

The Commission should work with stakeholders to develop guidelines to define mobile device accessibility and access to wireless services. When developing such guidelines, the Commission should adopt usability standards, rather than just technical requirements. Usability standards are more flexible to allow future technological developments and are more responsive to the needs of users. The Commission should also work with carriers and manufacturers to spread awareness about accessibility and devices that incorporate it. Although it is important for innovators to continue to create new ways to make devices accessible through nonvisual means, Apple has demonstrated that there are many cost-effective solutions already in use for manufacturers to employ. However, until

manufacturers see the mutual benefit of creating accessible phones (thus gaining new customers and selling more products), it is important for the Commission to make resources available in a centralized manner so blind and deaf-blind users can learn about accessible devices and services available to them.

Accessible technology offers opportunities for full community participation for blind people that have never been possible before. In order for those opportunities to become reality, as technology becomes more advanced and older technologies become obsolete, accessibility must be built into all developing technologies. Otherwise, the digital divide will continue to widen and leave blind people even more excluded than before. The severely limited choice of mobile phones available for blind people is unacceptable, and companies can, should, and will benefit from following Apple's example in creating accessible products.